

## *A Comparative Investigation of the Microleakage of Biodentine and Mineral Trioxide Aggregate as Coronal Barrier in Nonvital Bleaching*

Marjan Bolbolian<sup>1</sup>,  
Farnaz Ghorbani<sup>2</sup>,  
Mostafa Ghandi<sup>3</sup>,  
Maryam Ghashami<sup>4</sup>,  
Baharan Ranjbar Omidi<sup>5</sup>,  
Monirsadat Mirzadeh<sup>6</sup>

<sup>1</sup> Assistant Professor, Department of Endodontics, Dental Caries Prevention Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

<sup>2</sup> Resident in Pediatric Dentistry, Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran

<sup>3</sup> Resident in Endodontics, Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran

<sup>4</sup> General Dentist, Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran

<sup>5</sup> Assistant Professor, Department of Operative Dentistry, Faculty of Dentistry, Qazvin University of Medical Sciences, Qazvin, Iran

<sup>6</sup> Assistant Professor, Department of Community Medicine, Metabolic Disease Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

(Received February 20, 2019 ; Accepted May 5, 2020)

### *Abstract*

**Background and purpose:** Internal bleaching is recommended to correct the discoloration of pulpless teeth. This study aimed to compare the microleakage of biodentine and mineral trioxide aggregate (MTA) used as an intracanal barrier in non-vital bleaching.

**Materials and methods:** An experimental study was performed in which 36 extracted mandibular premolars were randomly divided into two experimental groups (n= 16) and two control groups (n= 2). In experimental groups, 2mm of OrthoMTA and biodentine cement were placed as intracanal barriers. The control groups were prepared similar to experimental groups, except that in positive control group the orifice barrier material was not used and in negative control group the whole root surface was covered with nail polish and orifice barrier material was not used. Subsequently a mixture containing sodium perborate and 30% hydrogen peroxide was placed into the pulp chambers and replaced every three days. Microleakage was measured using a pH diffusion method by digital pH meter. pH was checked before placement and at days 1, 3, 6, and 9 after placement. Data analysis was done in SPSS V24.

**Results:** The pH value in negative control group was similar to that in normal saline group, while the pH value in positive control group was found to be significantly higher than other groups ( $P < 0.05$ ). No significant differences were seen in pH values between the experimental groups at baseline and days 1 and 6, but pH values of biodentine were significantly higher than orthoMTA at days 3 and 9 ( $P < 0.05$ ).

**Conclusion:** MTA can be used as an efficient orifice barrier during internal bleaching, specifically in cases where there is probability for cervical root resorption.

**Keywords:** tooth bleaching, mineral trioxide aggregate, dental leakage

**J Mazandaran Univ Med Sci 2020; 30 (186): 80-89 (Persian).**

\* Corresponding Author: Farnaz Ghorbani - Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran (E-mail: fghorbani39@yahoo.com)